

EARTHQUAKE-SHOCKS were felt on January 23 at Schattwald (Tyrol) at 10.45 a.m., direction west-east, and at Vils, Tannheim (Tyrol), and Oberdorf (Bavaria), at 8 p.m. A shock of earthquake occurred at Bucarest in the night of January 25-26, at 12.30, and at Tecucin and Marasesci (Roumania) on January 26 at 12.25 a.m. On February 5 a shock of earthquake was experienced at Nagy Iglo and Dees (Hungary) at 3.45 p.m., direction north-east-south-west.

THE additions to the Zoological Society's Gardens during the past week include a Malbrouck Monkey (*Cercopithecus cynosurus* ♂) from East Africa, presented by Mr. R. A. St. Leger; a Chacma Baboon (*Cynocephalus porcarius* ♂) from South Africa, presented by Mr. W. F. Battersby; an Amherst Pheasant (*Phasianus amherstiae* ♂) from Szechuen, China, presented by Mr. John Biehl; two Crocodiles (*Crocodilus*, sp. inc.) from South Africa, presented by Capt. D. King, R.N.; a Californian Quail (*Callipepla californica* ♀) from California, deposited; two Eagle Owls (*Bubo*, sp. inc.) from South Africa, on approval; a Red-fronted Lemur (*Lemur rufifrons* ♂) from Madagascar, a Common Otter (*Lutra vulgaris*) from Ireland, four Warty-faced Honey-eaters (*Meliphaga phrygia*), two Wattled Ducks (*Biziura lobata* ♂ ♂) from Australia, a Pink-footed Goose (*Anser brachyrhynchus*), European, purchased; a Hybrid Tapir (between *Tapirus roulini* ♂ and *Tapirus americanus* ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE ACADEMY OF SCIENCES, PARIS.—At the annual public sitting of this body on February 6, recommendations of a committee consisting of MM. Faye, Löwy, Mouchez, Janssen, and Tisserand, with respect to the award of the astronomical prizes of 1881, were adopted by the Academy. The Lalande Prize was awarded to Mr. Lewis Swift, of Rochester, New York, who in the course of four years has discovered seven comets, one of them of short period. The committee remarked that we have now a family of seven periodical comets, of which the aphelion distances do not differ much from the mean distance of Jupiter, and this great planet appears to have drawn them into our system. There are doubtless interesting researches to make on this point of theoretical astronomy: "La première chose à faire est de recueillir de nombreux matériaux; aussi convient-il d'encourager les travailleurs qui consacrent leurs veilles à la recherche des comètes."

The Valz Prize was awarded to Mr. David Gill, H.M. astronomer at the Cape of Good Hope, for his researches on solar parallax, and more especially for the results of his expedition to Ascension, for the observation of Mars at the close opposition of 1877. Mr. Gill has twice applied what is known as the *diurnal method* (first employed by Cassini two centuries since) to observations of Mars with the heliometer. The Ascension expedition is pronounced to have been a great success, twenty-two series of observations of Mars having been obtained, each of which affords a value of the parallax. The discussion of the observations proves that they were made with a high degree of precision, and the committee conclude that "la valeur qui en résulte pour la parallaxe du Soleil paraît devoir être l'une des plus exactes."

The prizes offered for the year 1882 are those founded by Lalande (a gold medal of 540 francs), by Valz (460 francs), and that instituted in 1863 by the Baronne de Damoiseau. The latter is continued for the same subject as on several previous occasions, when no adequate response was received, and the terms are thus stated:—"Revoir la théorie des satellites de Jupiter; discuter les observations et en déduire les constantes qu'elle renferme, et particulièrement celle qui fournit une détermination directe de la vitesse de la lumière; enfin construire des Tables particulières pour chaque satellite." Competitors are desired to give particular attention to one of the conditions—that relating to the determination of the velocity of light. The value of the prize is 10,000 francs; memoirs received till June 1, 1882.

THE TOTAL SOLAR ECLIPSE OF MAY 17.—It appears that astronomy is to be once more indebted to the scientific spirit and

munificence of M. Bischoffsheim, the banker of Paris (a valued friend of the late M. Leverrier), who, according to the *Times*, has undertaken the expense of a mission to Upper Egypt, for the observation of this phenomenon. Upper Egypt is about the only accessible locality available on this occasion, and in that district the duration of the total phase will be less than $1\frac{1}{4}$ minute. It will therefore be necessary for the observer to be situated close upon the central line of eclipse to secure a sufficient duration for any useful purpose. Hansen's Lunar Tables, as is well known, require correction at this time, but it happens that the Lunar Tables adopted in the "American Ephemeris" give the moon's place in pretty close agreement with that resulting from Hansen's, with Newcomb's corrections applied, and the track of total eclipse given in detail in that Ephemeris may be taken as almost as reliable a prediction as it will be possible to make. We extract as follows:

Greenwich Mean Time	Long. E. Lat. N. h. m.	Central Line.		S. Limit. Long. E. Lat. N.
		Long. E. Lat. N.	Long. E. Lat. N.	
May 16	18 20 ... 28 39' 9 ... 25 17' 5	28 55' 8 ... 25 8' 0	29 11' 7 ... 24 58' 5	
	18 25 ... 31 21' 4 ... 26 42' 5	31 37' 0 ... 26 31' 9	31 52' 6 ... 26 27' 3	
	18 30 ... 33 50' 8 ... 28 0' 6	34 6' 1 ... 27 48' 9	34 21' 4 ... 27 37' 2	
	18 35 ... 36 11' 5 ... 29 12' 8	36 26' 4 ... 29 0' 2	36 41' 3 ... 28 47' 6	

The duration of totality upon the central line, assuming the sun's semi-diameter $15' 50'' 8$, and the moon's geocentric semi-diameter $15' 51'' 9$, will be at the above Greenwich times respectively, 1m. 6' 35., 1m. 12' 05., 1m. 17' 15., 1m. 21' 8s.: an observer proceeding beyond the intersection of the central line with the Nile, say to Ras Mahomed at the extremity of the peninsula of Sinai, will not therefore secure an increase of ten seconds in the length of the total obscuration. We hear reports of an intention on the part of several American astronomers to visit Egypt for the observation of the eclipse, and hope this country may not be unrepresented.

THE TRANSIT OF MERCURY, NOVEMBER 7, 1881.—This phenomenon appears to have been well observed in Australia. If the times of internal contacts are founded upon Leverrier's tables of sun and planet, and the semi-diameters he deduced from a discussion of the transits of Mercury to 1845, the Melbourne observations indicate that the computed time of first internal contact is too early by $24' 5''$, and that of last internal contact by $26' 05''$. According to the observations of that able amateur, Mr. Tebbutt, at Windsor, N.S.W., these errors are respectively $20' 8''$, and $27' 35''$. The calculations of the American ephemeris, where Leverrier's old theory of the planet (*Connaissance des Temps*, 1848) is adopted, exhibit much larger errors, at least as regards the exterior contacts, for which alone the formulae of reduction for parallax are given. The experience is therefore the same as at the previous transit on May 6, 1878.

GEOGRAPHICAL NOTES

AT the meeting of the Geographical Society on Monday last, Sir Richard Temple delivered a lecture which nominally dealt with the geography of the birthplace and cradle of the Mahratta power in Western India, but practically became rather a disquisition on the history of the race, and much of the information furnished will, no doubt, have been familiar to readers of Meadows Taylor's work.

SOME further fragments of news have come from the rescued members of the *Jeannette* expedition. Every effort is being made to find Captain De Long and his companions, but at this season, and in such a region as the Lena mouth, the searchers have a hard task before them. Lieut. Danenhauer sends some interesting notes on the course taken by the *Jeannette*:—"We discovered Jeannette Island May 16, 1881 (?), in lat. $76^{\circ} 47'$ long. $158^{\circ} 56' E$. It was small and rocky, and we did not land upon it. Henrietta Island was discovered May 24, in lat. $77^{\circ} 8'$ long. $157^{\circ} 43' E$. We visited it, and found it to be an extensive island, animals scarce, many glaciers. A very large island, found in lat. $76^{\circ} 38'$ long. $148^{\circ} 20' E$. was named Bennett Island. On it we found many birds, old horns, driftwood, and coal; no seal or walrus; strong tidal action; bold and rocky. The south cape we named Emma. The general health of the crew during twenty-one months was excellent, no scurvy. We used distilled water, bear and seal meat twice a week, but no rum. Divine service was held regularly. We took plenty of exercise, and everybody hunted. Game was scarce, but we got thirty bears, 250 seals, and six walrus; no fish or whales seen. All possible observations were made during the

drift, the result showing north-westerly course, the ship heeling over, and being heavily pressed by ice most of the time. The mental strain was heavy on some of us. The result of the drift during the last five months was 40 miles by tidal movement of ice; very rapid drift the last six months. Soundings pretty even—18 fathoms near Wrangel Land, which often visible 75 miles distant. The greatest depth was 80 fathoms; average depth, 35; bottom, blue mud; shrimps plentiful; meteoric specimens got from bottom; surface water temperature, 20° above zero. The extremes of temperature of air were—cold, 58° below zero (Fahrenheit); heat, about 44° above. During the first winter the mean temperature was 33° below zero, second winter 39° below. During first summer mean temperature was 40° above zero. The heaviest gale showed a velocity of 50 miles an hour, but such gales were not frequent. Barometric and thermometric fluctuations were not great. There were disturbances of the needle coincident with the auroras. Telephone (?) wires were broken by the ice movements. Winter's growth of ice was 8 feet. The heaviest ice seen was 23 feet thick. During the first week of the retreat from the *Jeannette* we drifted back 27 miles more than we could advance. The snow was nearly knee-deep. The naturalist's notes were saved, but the photographic collection was lost with the ship. Lieut. Chipp's 2000 auroral observations were also lost." Thus it would seem that the *Jeannette*, like the *Tegethoff*, was caught in the ice soon after she entered on her task, and was drifted about in it for many months. The islands discovered are doubtless part of the Arctic archipelago which surrounds the Polar area, and of which Franz-Josef Land, the New Siberian Islands, &c., are outliers. The full record of scientific observations promises to be of some value.

WE understand that the Admiralty are unwilling to send a national expedition in search of Mr. Leigh Smith and the *Eira* Expedition, but have at the same time expressed their readiness to propose a grant of 5000*l.* towards the expense of a private expedition.

DR. SCHWEINFURTH is said to have had a letter from the Marchese Antinori, telling him that he has heard in Shoa of the existence of a race of pygmies to the south-east of Kaffa. They are called Dakos by the Kaffa people, and Jukis by the Gallas. From their reported position it is thought probable that they belong to the same race as the Akkas.

M. JOSEPH MARTIN has on exhibition at the French Geographical Society a collection of photographs, maps, mineralogical specimens, &c., which he has made during a long sojourn in Siberia, where he has been engaged in examining gold, silver, and other mines. During his journey he traversed the Ural, where he was chiefly occupied at the Beresofski gold-mine, visiting also several mines of precious stones, iron, &c. He next went to the Ob, where he examined the mountains round Tomsk, afterwards visiting the gold and silver mines in the Altai. Having visited the Upper Yenisei, he made a geological examination of the Baikal region, and then descended the Lena to the mouth of the Aldan, up which he went for some distance. He also visited the Olekma and Vitim rivers, where gold-mines are being worked, and then made some mineralogical researches in the Stanovoi Mountains. He visited the Transbaikal region and a part of Mongolia, and then followed the Chinese frontier from Kiachta to Vladivostock, after which he spent some time in mineralogical investigations on the Amur and the Ussuri, and in other parts of Russia, and Chinese Manchuria. M. Martin intends in April to start on a journey of exploration in the Kamchatka peninsula.

THE Dépôt de la Guerre at Paris has just published the first four sheets of a map of Africa, which, when finished, is to consist of sixty sheets. This map has been prepared by Capt. Lannoy.

In a paper which he has read before the French Geographical Society, Col. Veniukof, the well-known Russian traveller, estimates that a third of Asia, as well as a thirtieth part of Europe, still remains to be explored.

THE Lisbon Geographical Society has founded a section in the Azores.

DURING the past year the agents of the London Missionary Society in New Guinea have paid some attention to the previously unknown Maiva district, lying some distance to the west of Port Moresby. In June the Rev. James Chalmers started a second time to visit the region, landing at Miria's village on the

Maiva coast. After going to several villages on the coast and in the interior, he determined to visit Madu, the chief of Motu Lavao. Starting from the bight, he ascended a large creek with dense mangrove on both banks—a veritable bed of fever—and then walked through the deserted village of Paitana to Motu Lavao, the path leading through a narrow tract of good country, with dense swamps on both sides. The village was found to be large, with clean and well-kept houses, but situated in a most unhealthy locality. At the end of July Mr. Chalmers again re-visited the Maiva district, in company with the Rev. W. G. Lawes and his wife.

THE Society which was formed at Milan for the commercial exploration of Africa, has already examined the Barka plateau, and founded two stations at Bengazi and Derna, and this year it proposes to send agents to accompany an Arab caravan from the Mediterranean to Wadai, across the desert, and through the oases of Anjila, Jalo, Kufra, and Wanianga. The Society also hopes to obtain the necessary firmans from Constantinople to enable it to establish an agricultural colony to the east of the Barka plateau, and if possible, an attempt will even be made to explore the routes leading from Abyssinia towards Assab, the Italian settlement on the Red Sea.

PHYSICAL NOTES

M. PLANTÉ has found that the long process of "forming" his accumulators is shortened if they are warmed during charging. The temperature best for this purpose is between 70° and 80°, at which limit the opposing electromotive force is somewhat less than when cold, and the resistance a great deal less. He does not find it advantageous to exceed this limit. We venture to suggest that the reason is that at boiling-point the oxygen and hydrogen are evolved in normal conditions, no ozone being produced. The electromotive force of oxygen against hydrogen is less than that of peroxide of lead against metallic lead, and far less than that of ozone against "nascent" hydrogen.

PROF. ANDREA NACCARI has re-examined the question of the unequal heating of the electrodes of a Holtz's induction machine by the passage of sparks. After carefully tabulating his results, he comes to the conclusion that in every case the negative electrode is less heated than the positive; that the heat developed in the spark is not affected by the nature of the metals of the electrodes; that with a constant striking-distance between the ends of the electrodes the heating effect in each electrode is proportional to the quantity of electricity that passes in unit time; and that the quantity of heat thus developed by the passage of the electricity between the electrodes is very considerable.

PROF. MANFREDO BELLATI and Dr. R. Romanese have investigated the rapidity with which light modifies the electric resistance of selenium. The question has a practical bearing upon the construction of the photophone, since, if the time required to produce this change were considerable, the most rapidly vibrating sounds would become confused or inaudible in transmitting them. When light falling on a selenium cell was interrupted 1250 times per second, the resistance was practically the same as with a far less rapid interruption giving equal average illumination. All the experiments of these gentlemen led to the result that selenium behaves sensibly, as if the variation of resistance by the incidence of light were effected instantaneously.

M. LIPPmann has applied his capillary electrometer to the study of the electric conductivity of shellac, gutta-percha, turpentine, petroleum, and other bodies, which, though insulators, when cold, begin to conduct as their temperature is raised. This subject was investigated in 1875 by Sir W. Thomson and by Mr. (afterwards Professor) Perry, more particularly in the one case of hot glass. In M. Lippmann's experiments a battery of one to forty voltaic cells was placed in a circuit in which the capillary electrometer was included, and in which the substance to be examined was interposed between two platinum plates. At ordinary temperatures the electrometer gave no indication, but moved forward as the temperature was raised to 100° C. As the temperature fell, the substances examined resumed their former state as insulators. A paper on the same subject has, we observe, been recently communicated by Mr. T. Gray to the Royal Society.

M. H. DUFOUR has made an interesting observation of no small importance in the theory of gaseous absorption of radiant